



**King County**  
**E-911 Program Office**  
Emergency Management Division  
Department of  
Information and Administrative Services  
7300 Perimeter Road South, Room 128  
Seattle, WA 98108-3848  
(206) 296-3910

November 24, 1998

Nancy Boocker, Deputy Bureau Chief  
Wireless Bureau  
Federal Communications Commission  
2025 M Street  
7<sup>th</sup> Floor, Room 7002  
Washington, DC 20554

Dear Ms. Boocker:

The purpose of this letter is to inform you of our assessment of Integrated Data Communications' (IDC) wireless phone location technology. The King County E-911 system is heavily impacted by wireless 911 calls, and due to the difficulties and delays in handling these calls due to the lack of location information, has been actively involved in evaluating the various Phase II location technologies which are developing throughout the country. As part of this process, our office, along with the local exchange carrier which provides our Enhanced 911 service and several wireless carriers, participated in a technical evaluation of IDC's GPS location technology. This evaluation was conducted from June 1 to October 1, 1998 in various areas within King County. Based on the results of this technical evaluation, including the observations and use of the technology by my staff, 911 call takers, and myself, it is our belief that GPS technology is very effective at locating wireless callers and is a viable solution in meeting the FCC's requirements for Phase II wireless Enhanced 911 service. This technology is an effective solution for a variety of reasons, which are outlined below.

#### Accuracy

One of the most critical factors in being able to quickly respond to wireless 911 calls based on Phase II location information is the accuracy of the location provided. Many wireless callers who make 911 calls are in situations where they are unable to accurately describe their location to the 911 call taker. In such situations, the accuracy of the location technology used to locate the caller will be critical to being able to provide rapid emergency assistance. For the purposes of this technical evaluation, our office established the requirement of locating wireless callers to within 40 feet. This requirement was developed through discussions with 911 centers in Washington State, where the terrain in which wireless callers need to be located includes large

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urban, suburban, rural, and mountainous areas. In order to test the ability of GPS technology to locate callers in these difficult terrains, areas of King County which include these different settings were identified as test areas.

In the field tests conducted during the technical evaluation, IDC's GPS technology was repeatedly capable of locating the wireless caller to within 40 feet, 80% of the time. In the other 20% of calls, IDC's technology located the wireless callers well within the FCC Phase II requirements of 125 meters, 67% of the time. This included calls from all of the different terrains discussed in the previous paragraph. I personally had the opportunity to make test calls from narrow alleys between the skyscrapers in downtown Seattle, and call takers at the 911 center were able to repeatedly pinpoint my exact location.

In addition to test calls from static locations, several tests in which the caller was moving were conducted. In these situations, 911 call takers were able to track the progress of the caller on the 911 computer screen as IDC's technology pinpointed each consecutive location.

#### **Reliability**

Another important function of Phase II location technology is the reliability of the technology in being able to locate callers. During this technical evaluation, IDC's GPS technology was able to locate 100 % of the calls which were transmitted. All calls which processed through the wireless network to reach the 911 network and the 911 center were located. Once again, this is a critical factor in evaluating Phase II location technologies.

#### **Selective Routing**

King County's Enhanced 911 system provides service to 1.6 million people through 18 different 911 centers. Due to the complexity of our system, it is critical that the Phase II location technology implemented within our area be highly accurate so that the selective routing of wireless 911 calls to the appropriate 911 center is possible based on the caller's location. As a result, this was included as a requirement for this technical evaluation.

IDC was able to demonstrate the selective routing of wireless calls based on the caller's location. In multiple situations, test callers drove on freeways and then exited onto local roads while making test calls. The calls from the freeways routed to the Washington State Patrol's 911 center, and the calls from the local roads routed to the local police 911 centers. In one of these field tests, I drove on the major interstate through downtown Seattle, exited in the downtown area and proceeded on a city street which runs parallel and adjacent to the freeway. IDC's technology clearly distinguished between the freeway and the surface street, and routed my wireless calls to the appropriate 911 center.

Based on our experience in participating in this technical evaluation and on the results of this test, we are very excited about the capabilities of IDC's GPS technology. This technology has

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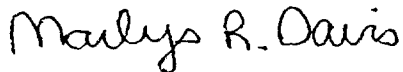
Nancy Boocker  
November 24, 1998  
Page 3

proven to be highly accurate and reliable, and has the capability of providing 911 centers with the tools they need to locate and provide emergency service to wireless 911 callers.

I strongly encourage the FCC to ensure that all Phase II location technologies, including handset solutions which use GPS technology, be given an equal opportunity to be evaluated as viable solutions for providing Phase II location technology to 911 centers.

I would be happy to answer any questions you or others at the FCC may have regarding this technical evaluation. Please feel free to contact me by phone at (206)296-3911, by fax at (206)296-3909, or by e-mail at [marlys.davis@metrokc.gov](mailto:marlys.davis@metrokc.gov) if I can be of any assistance.

Sincerely,



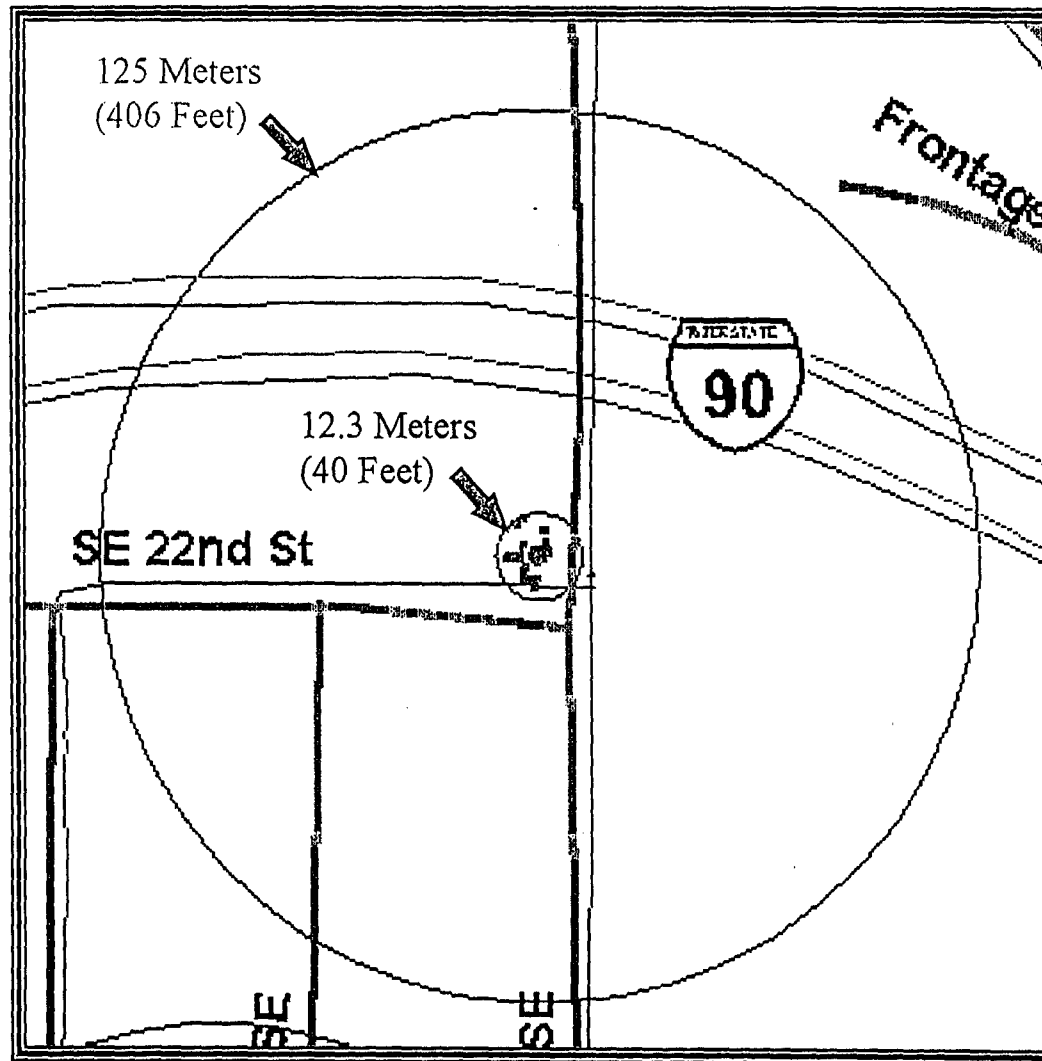
Marlys R. Davis  
E-911 Program Manager

Cc: Kevin Kearns, Manager, King County Emergency Management Division

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# *Integrated Data Communications*



RECEIVED

MAR 24 1999

FCC MAIL ROOM

# Purpose of Meeting

- Show FCC E911 Phase II requirements are reasonable and executable
- Discuss how IDC's handset based solution can meet and exceed the FCC's E911 Phase II guidelines
- Explain how IDC's technology works
  - Existing handsets
  - Future handsets
- Discuss wireless carriers and PSAP's issues and concerns
- Share IDC's 5 month real-life test results
- Show that IDC solution is:
  - Fast            - Economical
  - Accurate      - Retro-fittable
  - Reliable       - Available now

# IDC Company Overview

- Based in Bainbridge Island, Washington
- Solid background in wireless, telecommunications, DOD and DOE complex integration projects
- Currently 14 people
- IDC developed technology that receives input from GPS in handset and transmits longitude, latitude, altitude, time, direction and speed to a call taker station with no impact or modification to existing wireless or wireline carriers, regardless of cellular technology employed.
- IDC is consistently accurate to 40 feet or less
- IDC is low cost, retrofittable to existing cell phones and call takers stations.

# IDC Executive Team

**Dan Allen - President and CEO**

25 years telecommunications, 14 years cellular, led 10 start-up cellular companies domestic and international with Sprint, BellSouth International, TimeWarner, Nextel

**Dan Preston - Chairman, Founder, Chief Technical Officer**

20 years special applications contractor to DOD & DOE

**Jim Vroman - Founder, Executive Vice President**

30 years finance and business management

**Carl Peterson - Vice President Business Development**

17 years Motorola, President & CEO of Page Club USA

**Rod Proctor - Vice President Business Development**

16 years as President - Teltone, Tone Commander System, SeaMED

**David Twyver - Consultant**

Former President of Teledesic and Nortel Wireless

# FCC E911 Phase II Requirements

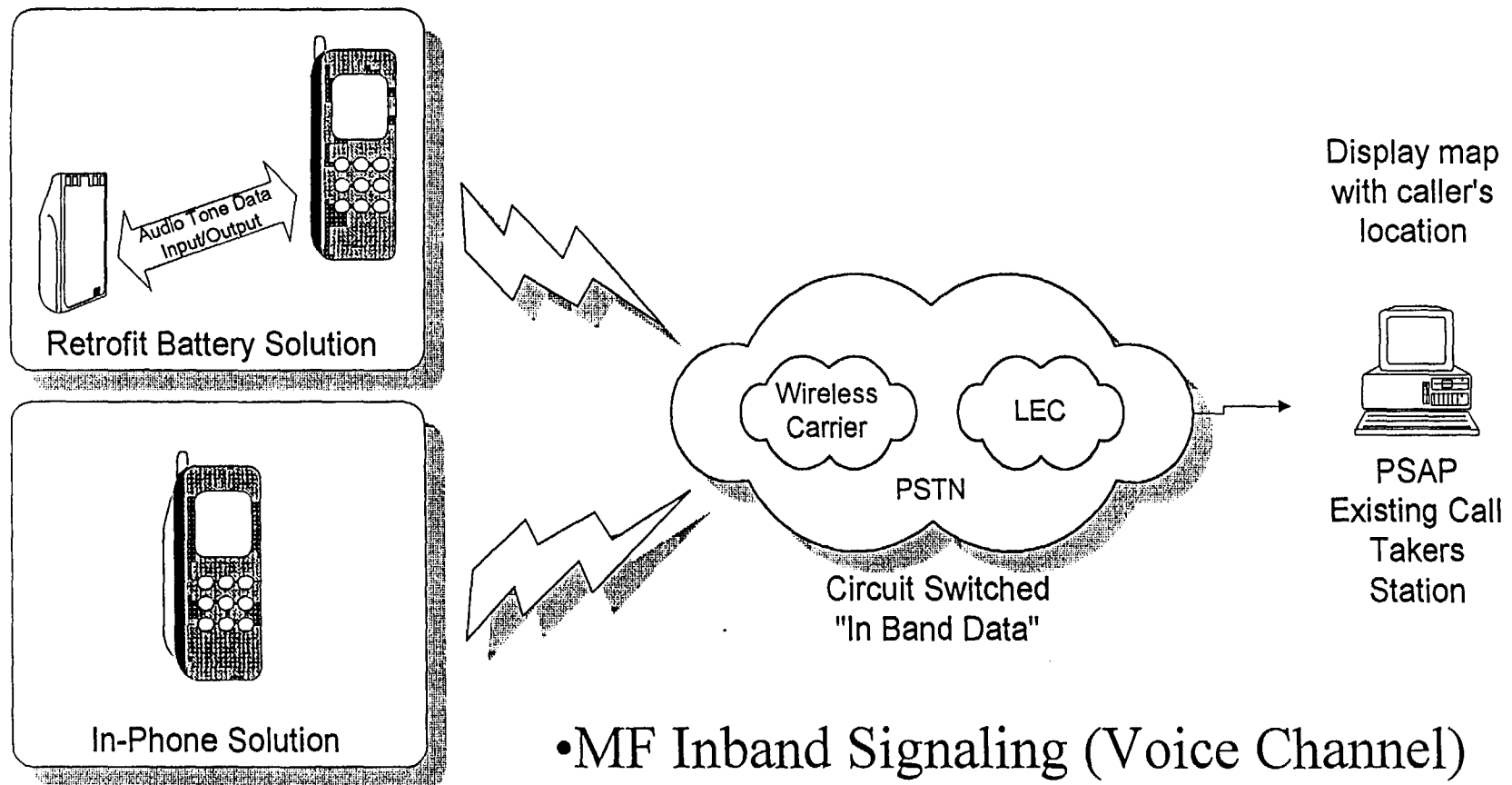
- October 1, 2001
- Wireless carriers must locate **ALL** wireless calls within 125 meters 67 percent of the time



# IDC Solution

- Accurate to 40 feet
- Compatible with all wireless technologies
  - AMPS - TDMA - CDMA - GSM - IDEN
- In-band signaling
  - Requires no network modification
  - Does not use overhead control channel
  - No impact on wireless & wireline networks
  - No capital investment by wireless or wireline carriers
  - Can route calls by caller location
  - FAST - Location appears on map as phone is answered
  - Can be retro-fit into batteries of existing phones
- Compatible with new & existing call taker equipment
- Can offer same level of service day one to Front Royal, Virginia as Washington D.C.

# IDC Handset Solution - End to End



- MF Inband Signaling (Voice Channel)
- 300hz - 3000hz
- No impact on infrastructure

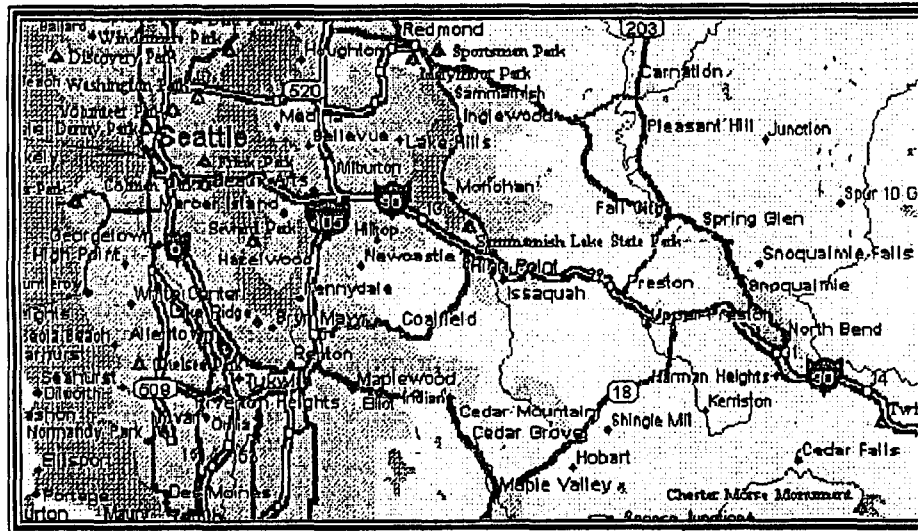
# PSAP Call Taker Issues

- Want location capability on cell calls now
- Need money for new equipment
- Need a solution that is:
  - Fast
  - Accurate
  - Reliable
  - Economical
  - Compatible

# Wireless Carrier Issues

- Must meet FCC October 1, 2001 deadline for Phase II
- Capital is tight
- Coverage is number one concern
- Overhead control channel is at or near capacity
- Network solutions require:
  - Modification to cell sites
  - Modification to switch
  - Carrier handling of X,Y
  - Use of control channel
  - Capital

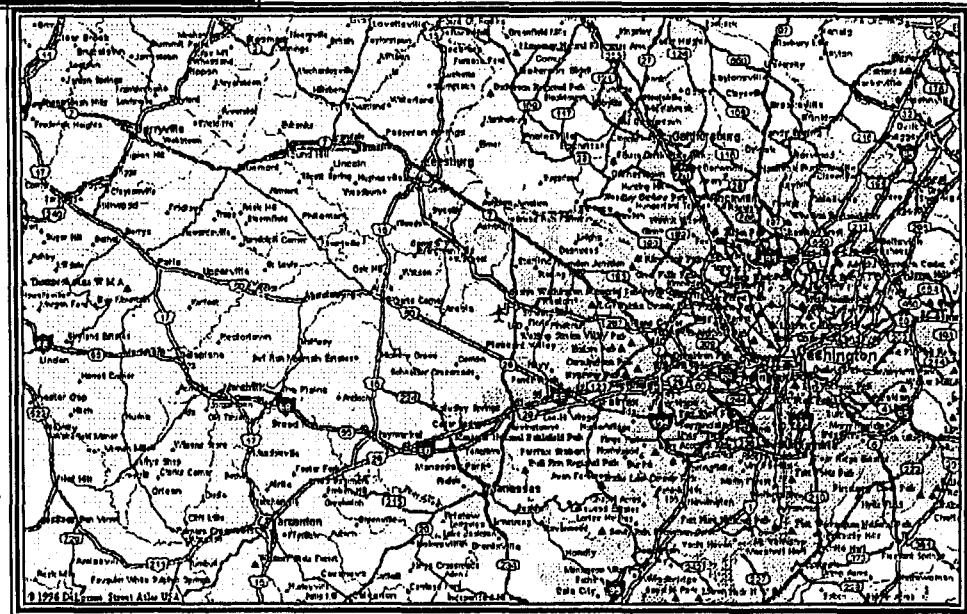
# Real Life Coverage Area



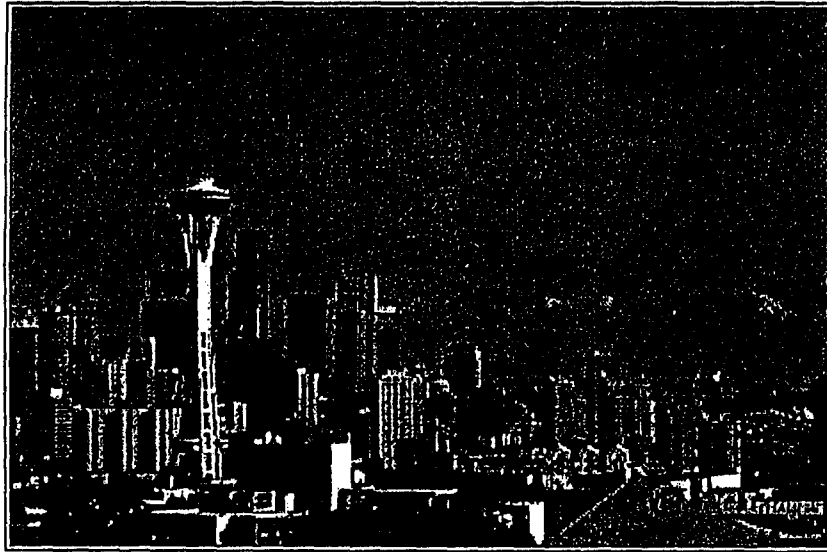
Seattle, King County, WA  
(Seattle to North Bend)

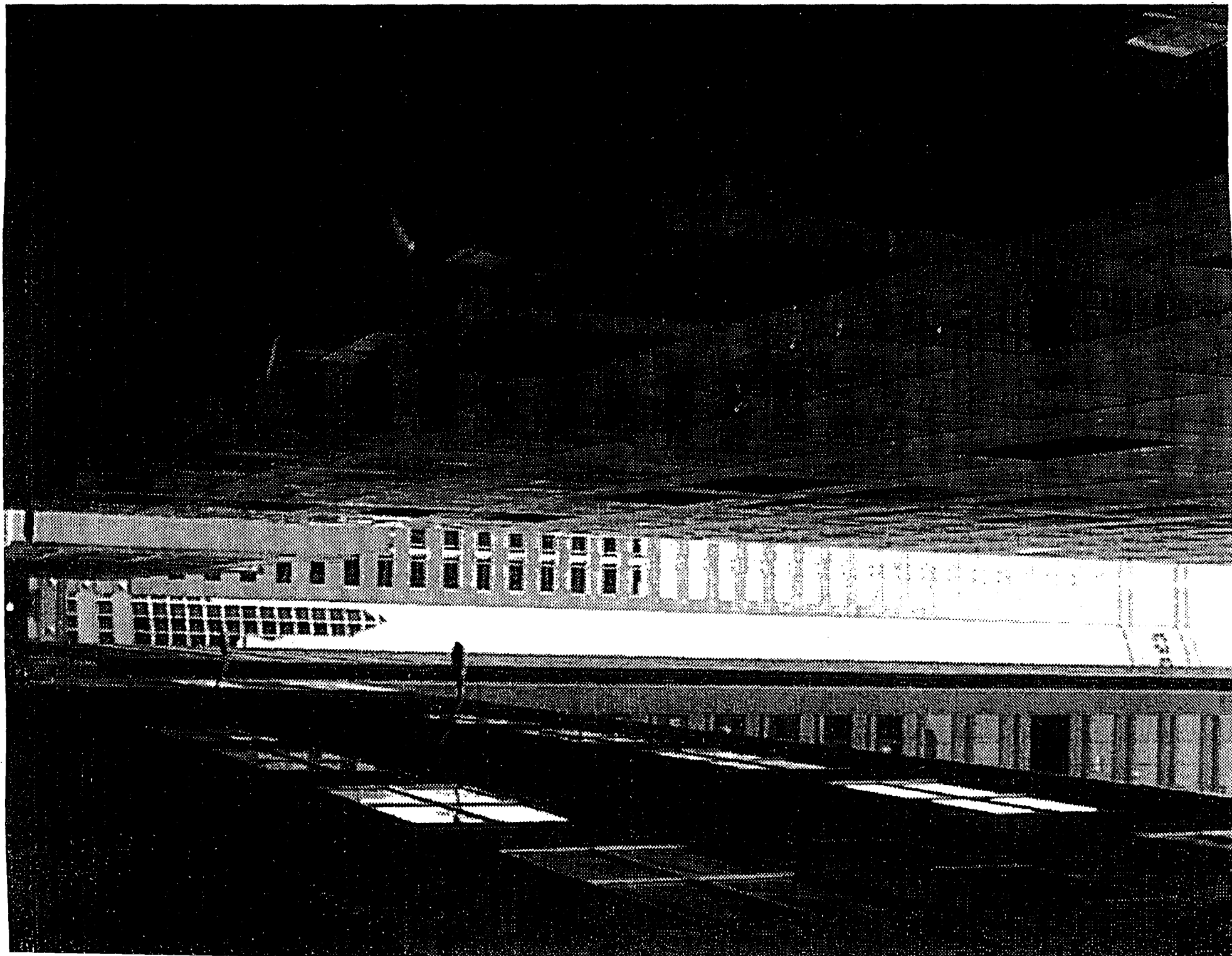
- Equivalent to -

Washington D.C.  
(Washington D.C. to Front Royal, VA)

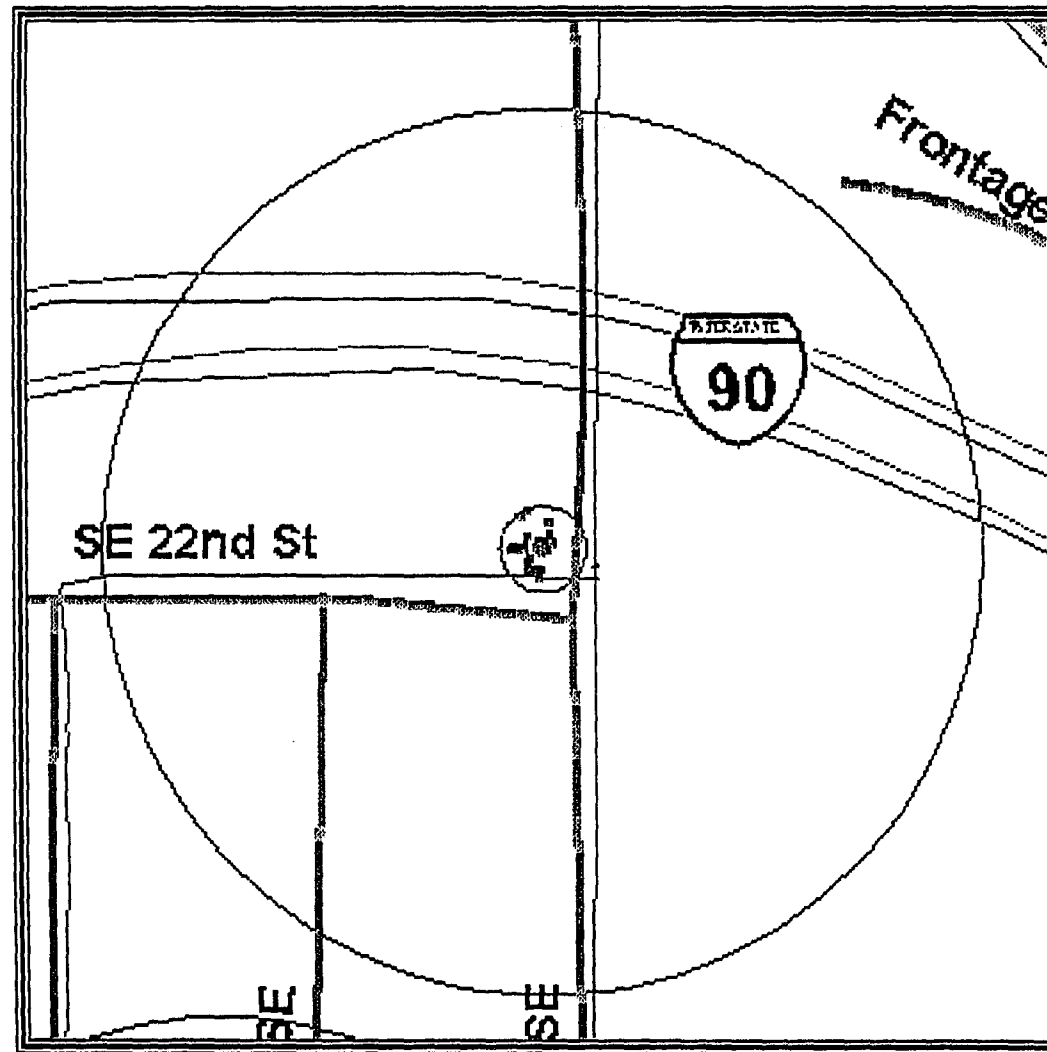


# Urban Canyon - Downtown Seattle



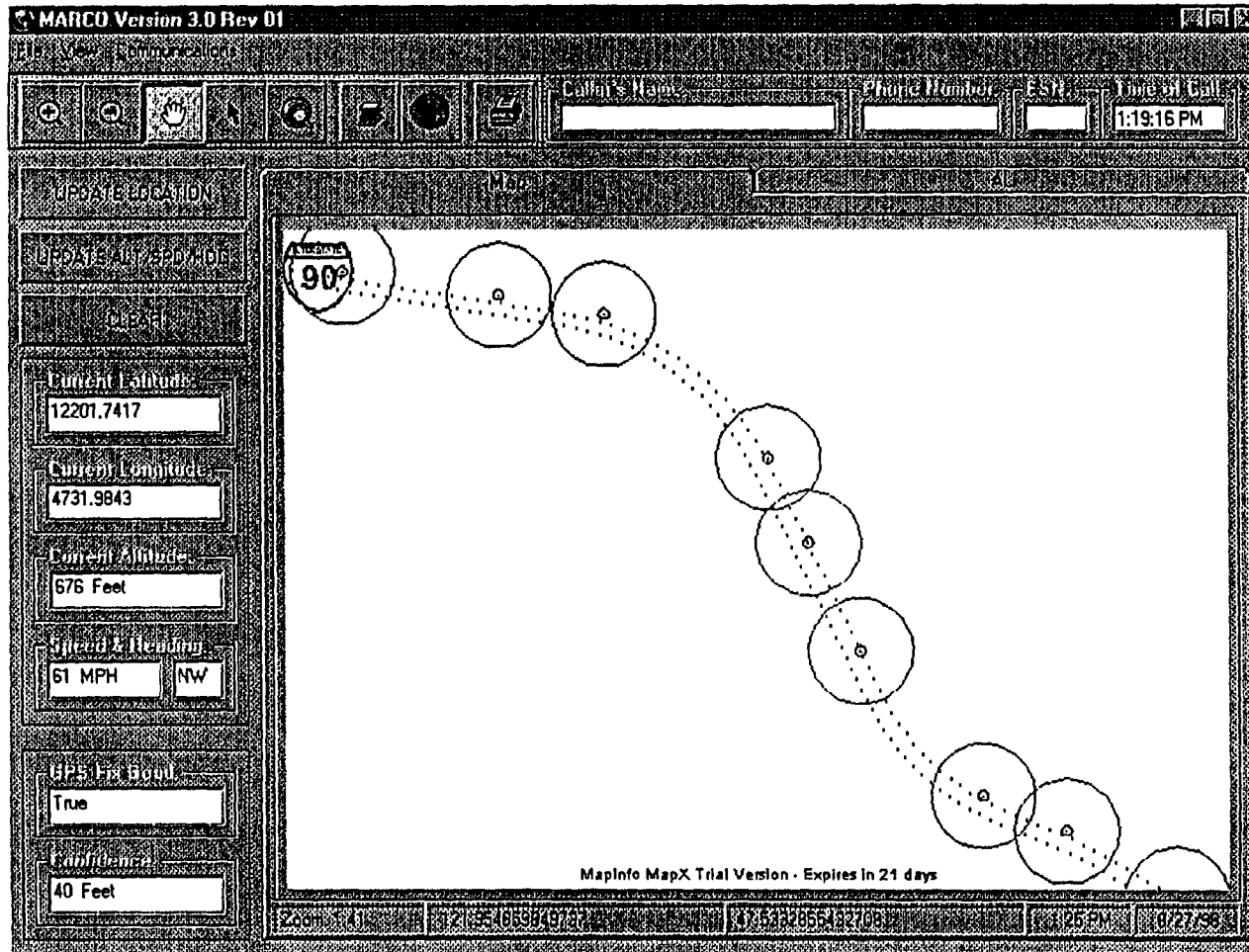


# IDC Accuracy

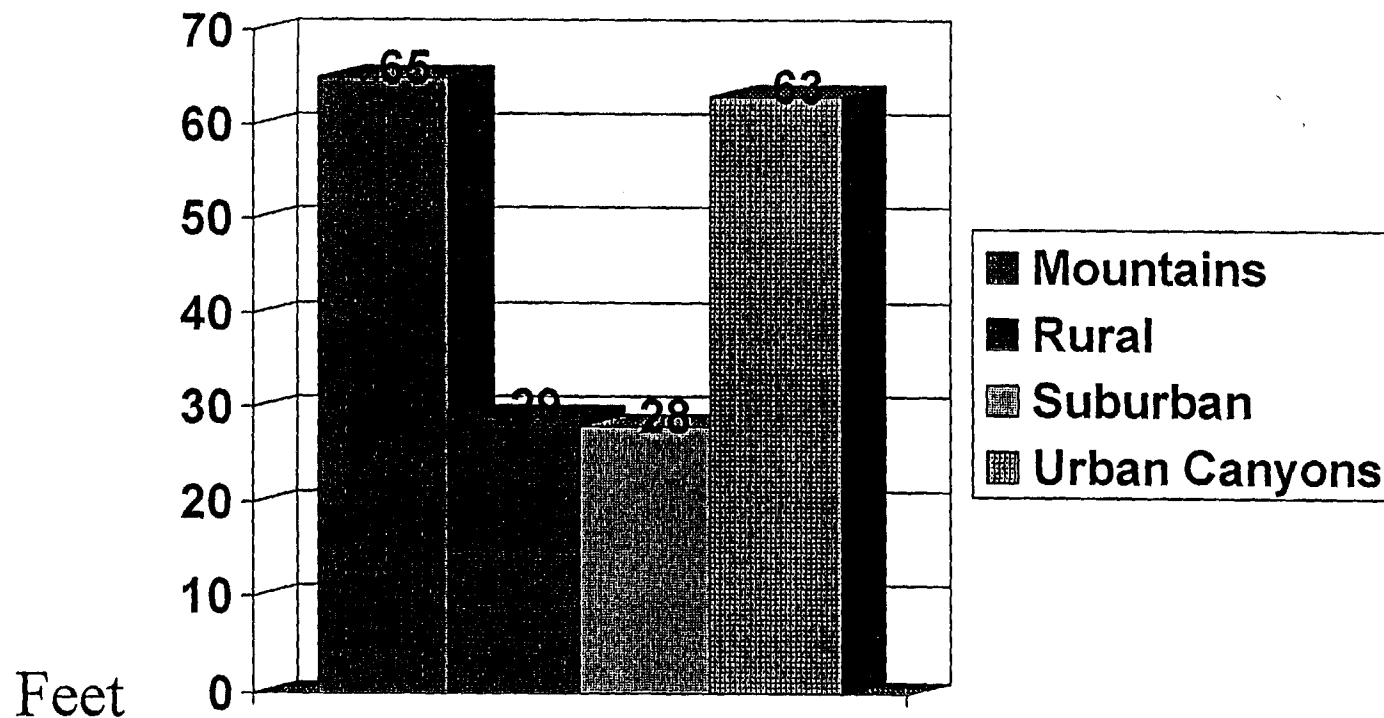




# Tracking and Refreshing

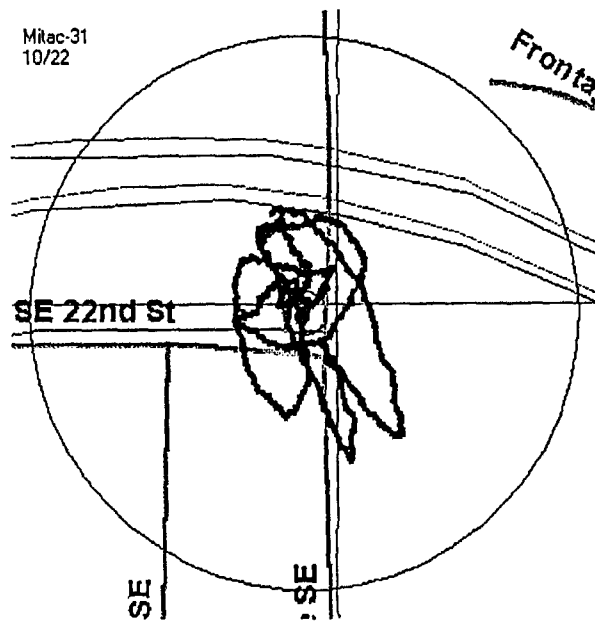


# Reliability and Accuracy

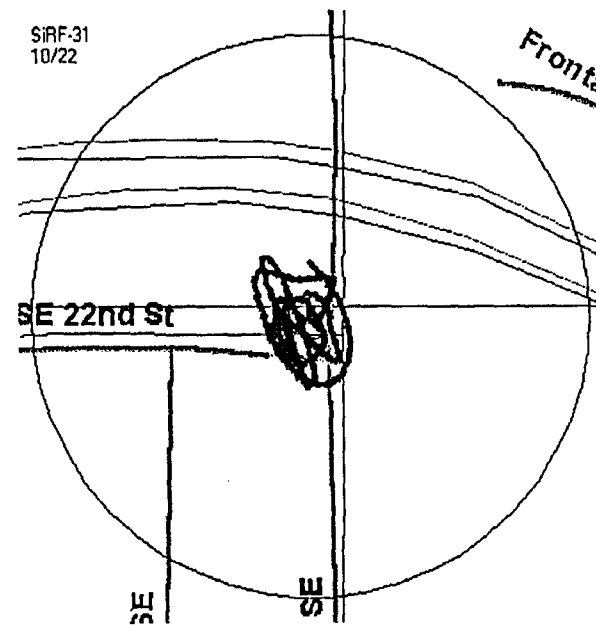


100% of ALL Calls Were Within 125 Meters  
67% of ALL Calls In Each of The Call Areas Were Within 70 Feet

# Technology Improvement



Beta 1.5



Beta 3.5

# IDC - The Right Solution

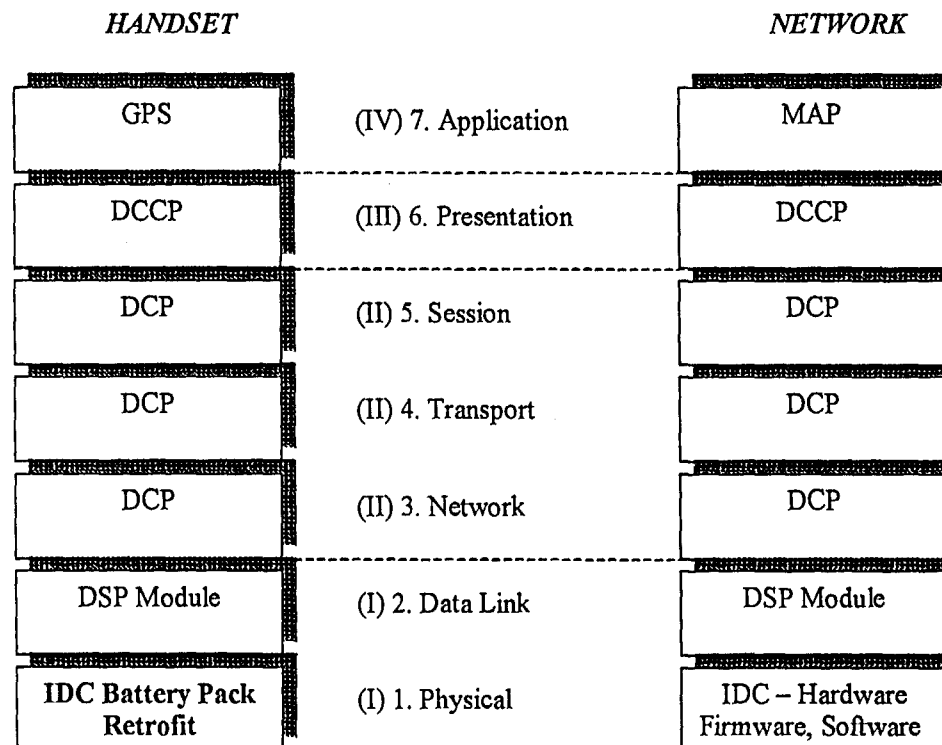
- Accuracy to within 40 feet (FCC requirement 125 meters = 406 feet)
- Delivers Longitude, Latitude, Elevation, Speed, Direction and Time on a map at a call takers station
  - Fast, Accurate, Reliable, Economical
- GPS in Handset - It works and is on the horizon (SiRF)
- Retro-fit in batteries for existing phones
- Built into new phones going forward
- In-band data transmission, open architecture, no network capital requirement
- Available today

# Appendix

- Support Documentation

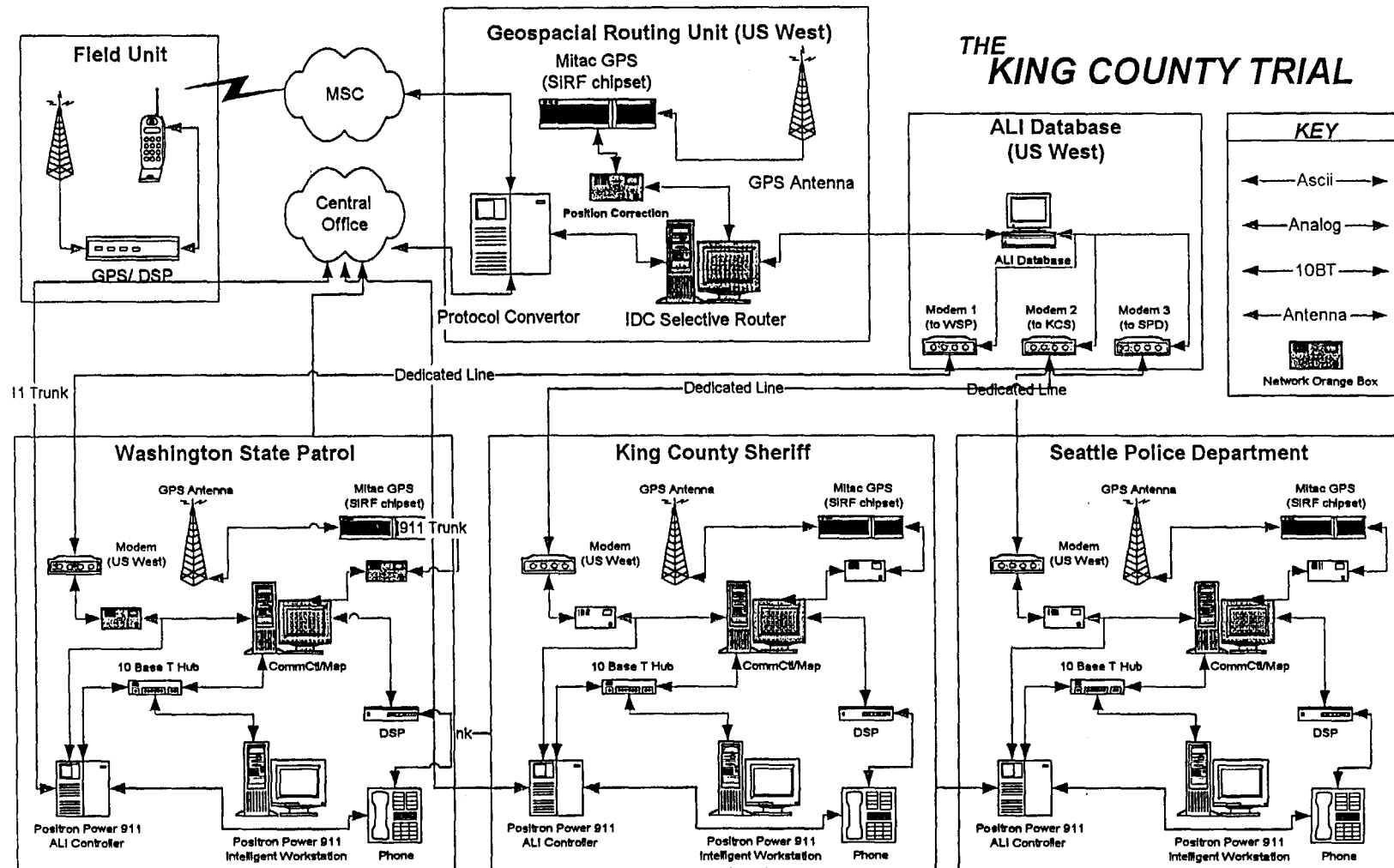
# Standard Reference Model

- IDC employed the industry standard reference model in developing it's solution



Open Systems Interconnect (OSI)

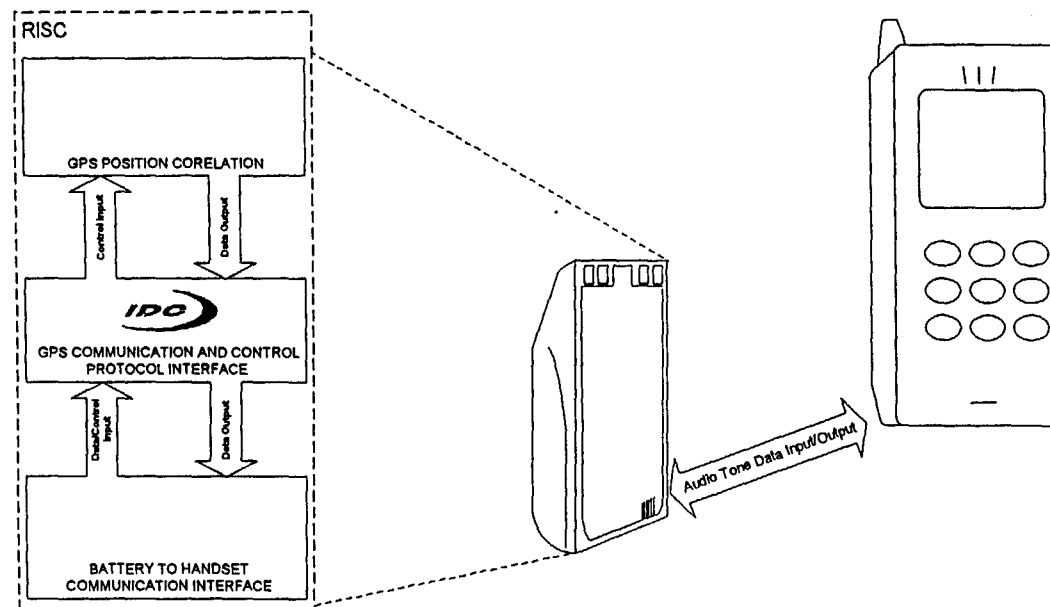
# IDC System Reference Model



# An IDC Solution: Retrofit

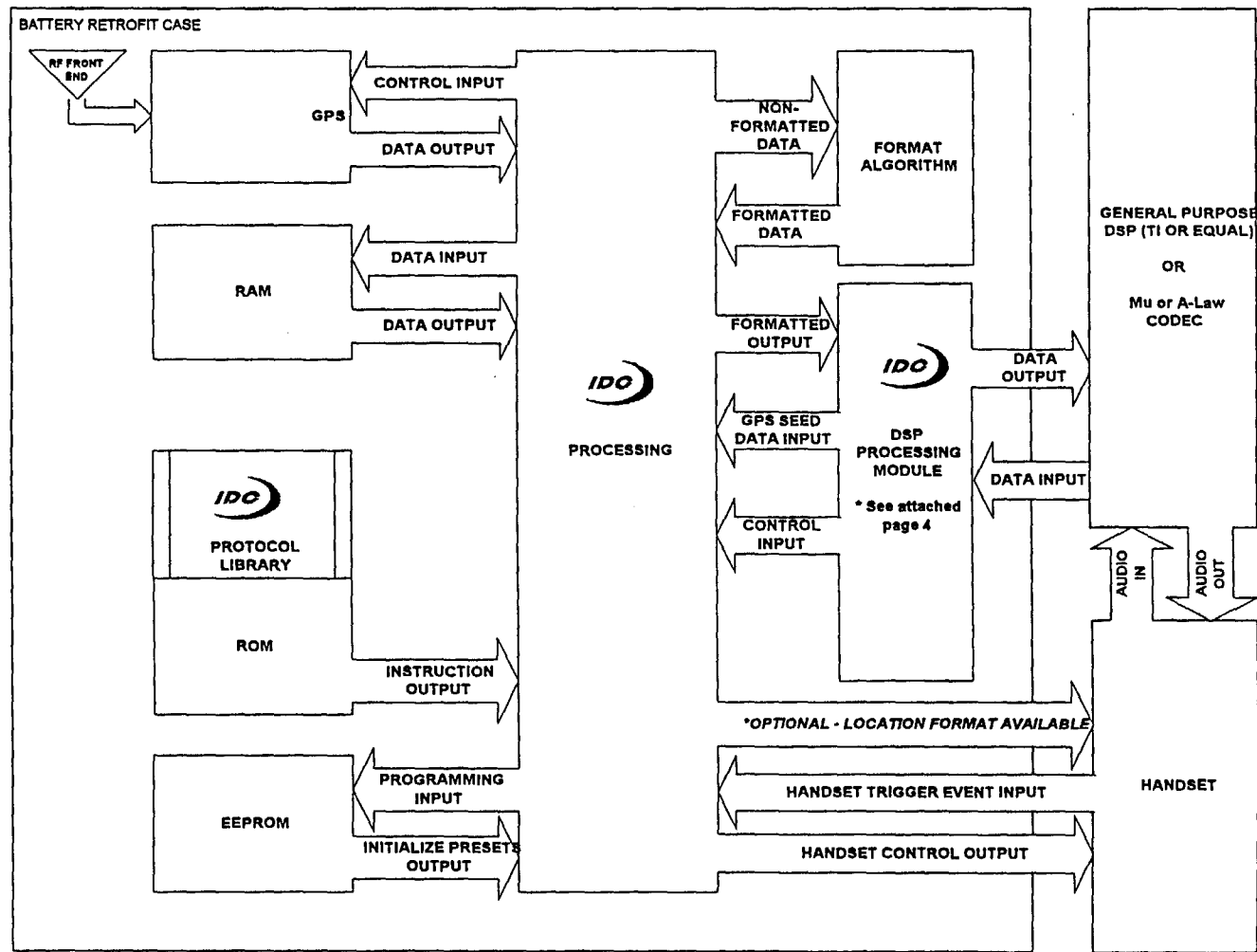
- Can be placed
  - In the battery
  - On the battery
  - Or between the battery and the cell phone

## GPS BATTERY RETROFIT





# Retrofit Firmware Architecture





**Integrated Data  
Communications, Inc.**

***The Handset-to-Headset Location Solution***

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Check out  
our updated website at  
[www.idc-seattle.com](http://www.idc-seattle.com)!

**INSIDE THIS EDITION OF THE LOCATOR**

- ♦ Location Technology Alternatives: Myths vs. Realities
- ♦ 6-Month WA Trial Proves Handset Solution
- ♦ FCC's New Waiver for Handset Solutions

EDUCATING THE PUBLIC SAFETY PROFESSIONAL

SEE IDC'S "HANDSET-TO-HEADSET" LOCATION TECHNOLOGY AT NENA '99 IN JUNE!

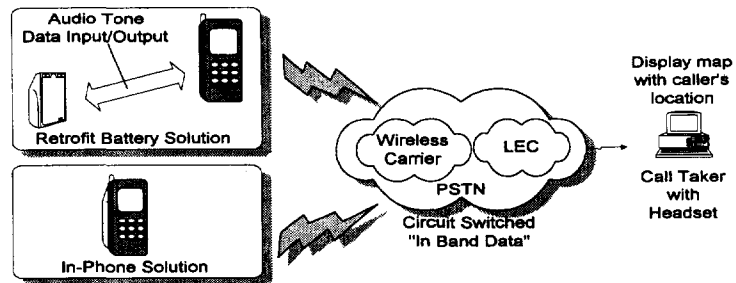
Integrated Data Communications  
750 Ericksen Avenue NE  
Bainbridge Island, WA 98110

BULK MAIL  
U.S. POSTAGE  
**PAID**  
PERMIT NO.  
2220

ADDRESS CORRECTION REQUESTED

## Summary of Features and Benefits

- Handset-based technology
- Exceeds FCC E911 Phase II requirements for accuracy
- No modifications needed to network infrastructure
- Uses in-band signaling
- Highly miniaturized, with low power and MIPS consumption
- Works on any wireline and wireless carrier format
- Low-cost retrofit to existing phones
- IDC enhancement reduces Selective Availability error
- Fast, accurate, and reliable
- Compatible with existing call-taker equipment



*This drawing represents IDC's "handset-to-headset" technology solution.*

### King County, Washington, Proves IDC's Solution

IDC recently concluded a 6-month comprehensive trial of handset-based GPS location-determining technology that included 12 vendors, 3 major national wireless companies, and more than 10,000 E911 calls made in real-life situations.

King County's E911 Program asked IDC to deploy and test requirements beyond those of the FCC mandate. King County's requirements included:

- Locating a caller to within 40 feet (12.3 meters)
- Routing calls based on the latitude and longitude of the caller
- Compatibility with all wireless carrier systems

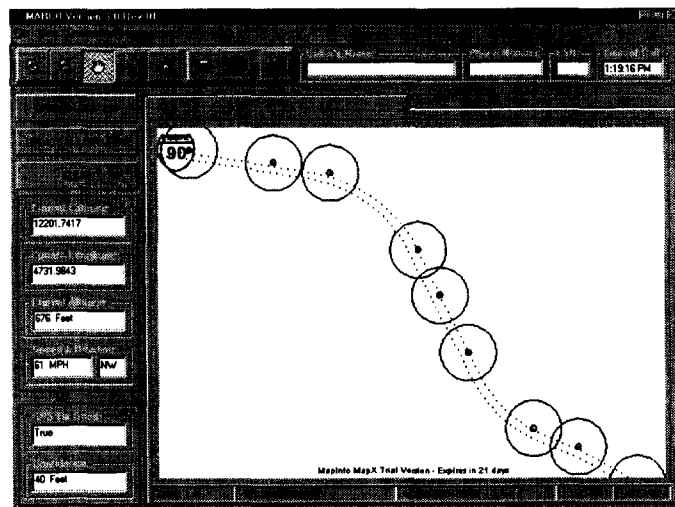
- Displaying caller's location graphically, using existing equipment
- Providing caller's altitude, speed, and direction of travel in addition to latitude and longitude
- Finding 90% of all callers

The King County, Washington, trial was highly successful and conclusive in proving that:

- Call location accuracy within 40 feet, 90% of the time is achievable TODAY
- The FCC Phase II E911 mandate can be met TODAY with a handset-based solution
- IDC's system is compatible with all wireless technologies and requires no modification to existing networks

## Potential Applications

- Emergency situations
- Roadside assistance
- Vehicle and fleet management
- Inventory/package monitoring
- Fraud protection
- Lost/stolen unit recovery
- Concierge and hospitality services
- Distance-sensitive billing
- Proximity-sensitive services
- Wireless system design
- Remote control and monitoring



*This screen capture from our King County, Washington, trial illustrates location information received as the caller drove west along I-90 to the Seattle area.*

*The call taker repeatedly refreshed the latitude, longitude, altitude, speed, and direction of travel over an elapsed period of time, while retaining call transfer capabilities.*

**FOR MORE INFORMATION ABOUT IDC, CONTACT KRISTIN QUICK**

Integrated Data Communications  
750 Ericksen Avenue NE  
Bainbridge Island, WA 98110  
kquick@idc-seattle.com  
www.idc-seattle.com  
(206) 842-9262

**IDC: FCC E911 PHASE II COMPLIANCE NOW!**

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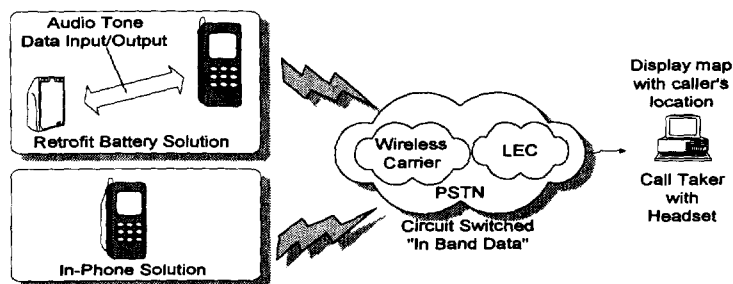
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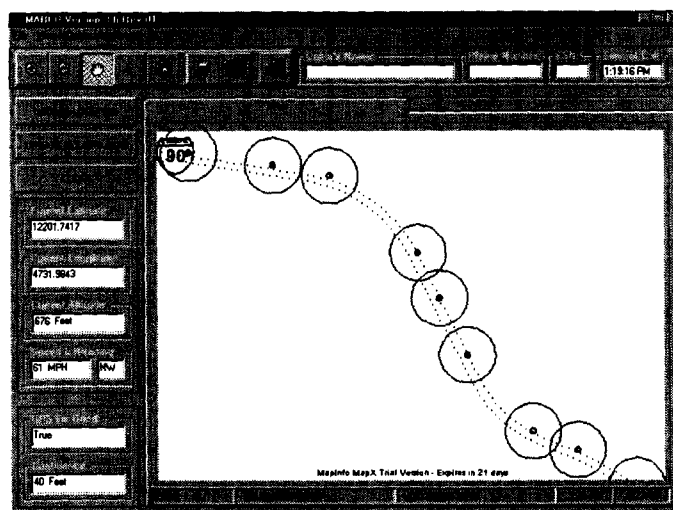
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(206) 842-9262

IDC: FCC E911 PHASE II COMPLIANCE NOW!

## **WHO IS INTEGRATED DATA COMMUNICATIONS (IDC)?**

A developer of handset-based location technology, **IDC** is a privately held company based in the Seattle, Washington area. **IDC** entered the location technology market in 1997 with a cost-effective and proprietary system to locate wireless phones and other wireless devices using commercially available Global Positioning System (GPS) technology.

## **WHAT IS THE IDC TECHNOLOGY?**

**IDC's** location technology is a field-proven solution, built into cellular phones and call-taker equipment, which enhances the performance of an onboard GPS, and enables the transfer of GPS-obtained location information to a display station. This position information, which includes longitude, latitude, altitude, speed, and direction of travel, passes through the voice channel and is graphically represented on a display terminal map. This technology is highly accurate, very reliable, and fast – **IDC's** solution has been scientifically documented to display positions to within 40 feet of the actual location, at real-time speeds.

## **WHAT IS GPS AND HANDSET-BASED LOCATION TECHNOLOGY?**



GPS is a constellation of 24 satellites that orbit at 11,000 nautical miles above the Earth. The satellites are operated by the United States Department of Defense and are used to transmit precise velocity, time and position (latitude, longitude, and altitude) information to GPS receivers.

Recently, GPS receivers and antennas have become highly miniaturized – the **IDC** receiver can be as small as a pencil eraser and requires little power. **IDC's** handset-based technology is independent of the wireless network infrastructure and is able to transport location and voice information across all wireline and wireless carriers. **IDC** uses in-band signaling within the carrier's voice channel, and uses the data transport of existing carriers to move the location information from the handset to the call-taker. **IDC** technology also works with any wireless air interface (e.g. CDMA, TDMA, iDEN, and AMPS).

## **WHO ARE THE CUSTOMERS OF IDC'S TECHNOLOGY?**

**IDC's** technology is highly beneficial to handset manufacturers, wireless carriers, wireline carriers, call-takers (such as E911 Public Safety Answering Points), and other service providers that value high-speed, highly-accurate location information. **IDC** recently completed an exhaustive field test of its end-to-end solution with the King County, Washington E911 Program office, public safety organizations, local wireless and wireline carriers, call taker equipment makers, and system integrators -- 14 companies in all. This pilot proved the value of **IDC's** technology in the Pacific Northwest's challenging conditions, including a variety of urban, rural, suburban, mountainous and waterfront environments.

## **WHAT DRIVES THE DEMAND FOR LOCATION TECHNOLOGY?**

The Federal Communications Commission (FCC) has mandated that, by October 2001, all wireless carriers must be able to locate a 911 call to within 125 meters, 67% of the time. The FCC developed this mandate to ensure the rapid, efficient, and effective deployment of Automatic Location Information (ALI) as part of E911, in order to promote the public safety and welfare. Furthermore, on December 24, 1998 the FCC released guidelines for wireless E911 rule waivers for handset-based approaches to Phase II ALI requirements (Public Notice DA 98-2631). A commitment by a carrier to provide a significantly higher level of accuracy, as with **IDC's** technology, or if the carrier began implementation of ALI capabilities before the 2001 deadline, are both actions which could help justify a phase-in of ALI over time. This phase-in would occur by upgrading existing handsets with battery packs, or embedding handsets with location technology. As of March 1, 1999, over 37 such requests have been submitted to the FCC.

**FOR IMMEDIATE RELEASE**

**CONTACT:** Andrew J. Rimkus  
IDC  
(206) 842-9262

**INTEGRATED DATA COMMUNICATIONS COMPLETES  
SECOND ROUND FINANCING**

***Location Technology Firm Raises Funds for Additional System Development***

**SEATTLE, WA -- FRIDAY, MARCH 12, 1999 --** Integrated Data Communications (IDC) today announced the successful completion of its second round of equity financing. The funds raised -- close to \$3 million -- will be used to continue development on the company's handset-based wireless location technology.

IDC, a development company headquartered near Seattle, Washington, entered the location technology market in 1997 with the development of a proprietary and cost-effective system to locate cellular phones based upon commercially available Global Positioning Satellite (GPS) information. The technology has multiple public safety, commercial and consumer applications

Along with four major wireless carriers, IDC recently completed a trial involving more than 6,500 E-911 calls from wireless phones. The company's system combines two technologies (location determination and inband data transmission) and, through both wireless and wireline networks, passes the location information through all types of existing wireless technologies to a call taker's station.

"Test results show that we can pinpoint the location of a cellular caller to within 40 feet," says Dan A. Allen, president and CEO of IDC. "Our handset solution is fast, accurate, reliable and economical, and requires no modification to existing wireless or wireless networks."

One major market for IDC's system has been mandated by the Federal Communications Commission (FCC), which has called for carriers to adopt technology, in two phases, that identifies the origin of wireless 911 calls. The emergency calls -- 85,000 per day -- are currently anonymous, and as many as thirty percent of the callers do not know their specific location.



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IDC  
(206) 842-9262

**INTEGRATED DATA COMMUNICATIONS COMPLETES  
SECOND ROUND FINANCING**

***Location Technology Firm Raises Funds for Additional System Development***

**SEATTLE, WA -- FRIDAY, MARCH 12, 1999 --** Integrated Data Communications (IDC) today announced the successful completion of its second round of equity financing. The funds raised -- close to \$3 million -- will be used to continue development on the company's handset-based wireless location technology.

IDC, a development company headquartered near Seattle, Washington, entered the location technology market in 1997 with the development of a proprietary and cost-effective system to locate cellular phones based upon commercially available Global Positioning Satellite (GPS) information. The technology has multiple public safety, commercial and consumer applications

Along with four major wireless carriers, IDC recently completed a trial involving more than 6,500 E-911 calls from wireless phones. The company's system combines two technologies (location determination and inband data transmission) and, through both wireless and wireline networks, passes the location information through all types of existing wireless technologies to a call taker's station.

"Test results show that we can pinpoint the location of a cellular caller to within 40 feet," says Dan A. Allen, president and CEO of IDC. "Our handset solution is fast, accurate, reliable and economical, and requires no modification to existing wireless or wireline networks."

One major market for IDC's system has been mandated by the Federal Communications Commission (FCC), which has called for carriers to adopt technology, in two phases, that identifies the origin of wireless 911 calls. The emergency calls -- 85,000 per day -- are currently anonymous, and as many as thirty percent of the callers do not know their specific location.

# NEWS RELEASE

For more information:

Kabby Hong  
Linhart McClain Finlon  
303-620-9044  
[khong@mcclainfinlon.com](mailto:khong@mcclainfinlon.com)

Cameron Barry  
Gilden Advertising  
410-377-5438  
[cameron.barry@gilden.com](mailto:cameron.barry@gilden.com)

## **Integrated Data Communications & SCC Communications Corp. Announce Successful Trial Of Phase II Enhanced 9-1-1 Technology In Seattle**

### **For Immediate Release: February 8, 1999**

SEATTLE, WASHINGTON -- Integrated Data Communications, Inc. (IDC) and SCC Communications Corp. (NASDAQ: SCCX) today announced the successful trial of Phase II E9-1-1 in Seattle using Global Positioning System (GPS) equipped cellular phones. IDC's GPS technology quickly identifies the location of a wireless 9-1-1 call using the latitude and longitude of a caller's signal, allowing the E9-1-1 system to route the call to the proper public safety agency and for the agency to quickly map the location of the emergency caller.

"IDC's technology, in cooperation with SCC's high-quality database, has resulted in an extremely accurate and effective tool for public safety and commercial applications," said Dan Allen, IDC's president and CEO. "The ability to route calls to the most appropriate call center, based on the mobile caller's location, will significantly reduce response times and increase efficiency."

The trial involved vehicles traveling down Interstate 5, which runs through the heart of Seattle, and placing wireless 9-1-1 calls. Not only did the calls go to the right Public Safety Agency, the caller's location was accurately displayed on the maps of the call-takers. Accuracy of 40 feet was obtained even from moving vehicles. This accurate location capability allows call routing decisions to differentiate between Washington State Patrol calls made from the Interstate and Seattle Police Department calls placed from streets adjacent to the freeway.

## **About IDC**

A developer of handset-based wireless location technology, Integrated Data Communications (IDC) is a privately-held company based in the Seattle, Washington area. IDC entered the location technology market in 1997 with a cost-effective and proprietary system to locate cell phones using commercially available Global Positioning Satellite (GPS) information. For more information about IDC, please go to the company website at <http://www.idc-seattle.com>.

## **About SCC Communications**

SCC Communications Corp., (NASDAQ: SCCX) is the leading provider of 9-1-1 operations support systems (OSS) services to incumbent local exchange carriers (ILECS), competitive local exchange carriers (CLECS) and wireless carriers in the United States. Based in Boulder, Colo., SCC has redefined the U.S. market for 9-1-1 OSS by creating the first and largest 9-1-1 service bureau, the SCC National Data Services Center (NDSC), with more than 75 million subscriber data records under management throughout North America. SCC also licenses its 9-1-1 OSS software to carriers that wish to manage the delivery of 9-1-1 data management services in-house. For more information about SCC Communications, please go to the company's Website <http://www.scc911.com>.

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# YOUR BUSINESS

THE SUN ■ SERVING WEST-SOUND ■ MONDAY, MARCH 8, 1999 ■ SECTION D

## SMART PHONE



Staff photo by Steve Zugachwerdt

**LOCATION, LOCATION, LOCATION:** Dan Allen, president and CEO of Integrated Data Communications of Bainbridge Island, is getting ready to market the software that will allow 911 centers to pinpoint the location of a cell phone that calls in.

# Placing a call

■ *A Bainbridge company is leading the race to put locator technology in cellular phones.*

**By Ed Friedrich**  
Sun Staff

A 78-year-old man with Alzheimer's disease ran out of gas last week at Mount Rainier. He had a car phone but couldn't tell anyone where he was. He was rescued, fortunately, after spending the night in the foothills.

If the same thing happens a year from now, technology developed by a Bainbridge Island firm will leave nothing to chance.

"If they would've had our technology, they probably would've known where he was within two car lengths in about 10 minutes," said Dan Allen, president and CEO of Integrated Data Communications.

Eleven million times a year, cellular phone users dial 911 but can't report their specific location.

That will change by Oct. 1, 2001. Federal Communications Commission rules will require that cellular phone companies be able to determine the location of at least 67 percent of their customers' phones.

IDC is poised to take advantage of that rule. Its system has been tested, and Allen says it is less expensive and more accurate than the other methods cellular companies might use.

It's cheaper because it uses existing global positioning system (GPS) satellites and cellular and land-line phone networks. All that's needed is a thumbtack-size chip to receive GPS signals and IDC's software to interpret that information.

IDC's software reads longitude, latitude, elevation, time, direction of travel and speed, and then displays a location on the dispatchers' computer screen.

The chips and IDC's software can be integrated into new cellular phone models or retrofitted into the battery packs of existing units.

IDC and four major wireless carriers tested the system in King County by placing more than 10,000 calls between skyscrapers, in the suburbs and in the mountains. The system determined locations to within 40 feet and also proved it could route the call to the proper 911 center. If the call comes from Interstate 5, it routes directly to the state patrol. If it comes from an onramp, it goes to Seattle police.

"The big winner is really the public,"

Allen said. "Knowing where people are in an emergency and being able to find them quickly is paramount."

The software was developed by Dan Preston and Jim Vroman, who founded IDC in 1997. Allen was brought in as president and CEO in October 1998 to take the product to the market and grow the company while the founders concentrated on the technology. IDC moved from Seattle to Winslow in December and now employs 16 people.

Others sought to solve the problem by using existing cell towers as reference points, but that turned out to be significantly more expensive and less accurate, Allen said.

"Dan and Jim just came up with a little simpler (solution), putting the intelligence within the cell phone so the intelligence goes wherever the caller goes."

IDC spent more than \$1 million developing the system and holds three patents on its technology. Allen expects cell phone manufacturers to begin installing the system late this year.

"We're very excited about the future opportunities," he said.

Reach reporter Ed Friedrich at (360) 415-2679 or at [efriedrich@thesunlink.com](mailto:efriedrich@thesunlink.com).

"If we can find one lost child or someone in a car overturned in a ditch because of this technology, the effort will be worth it."

**To reach us**  
 Call editor Jack Swanson at 842-6611 or fax information at 842-5867.

Wednesday, March 3, 1999 • Bainbridge Review

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## Taking 'caller ID' the next step

▼ *With a new outfit's product, 911 cell-phone callers can be located.*

By JACK SWANSON  
 Editor

So you're lost in the woods. You've just tripped over a log and broken your ankle, your water is running low and you're out of matches. But your cell phone is working! You dial 911.

Will anybody find you? If your phone's signal is picked up by any repeater station in the world and your handset is equipped with a new electronic chip containing software from a Bainbridge Island company, your chances are pretty good.

The cell site that receives your message will know your location within 40 feet and can transfer your call to the emergency service closest to you.

The software and tracking system were designed by Integrated Data Communications, a startup company located on Ericksen Avenue. The Federal Communications Commission has ordered that cell phone systems be able to provide the location of users by October 2001.

For the last six months, IDC has been doing tests on its system in western Washington with the full cooperation of the Seattle Police Department, King County Sheriff's Office and Washington State Patrol.

"We made 10,000 phone calls in Seattle's urban canyons, in rural areas around North Bend and up near Snoqualmie Pass," said Dan Allen, president and CEO of the firm. "More than 6,500 of them were scientifically documented. We encountered some bugs along the way, but in the end, the system was entirely successful."

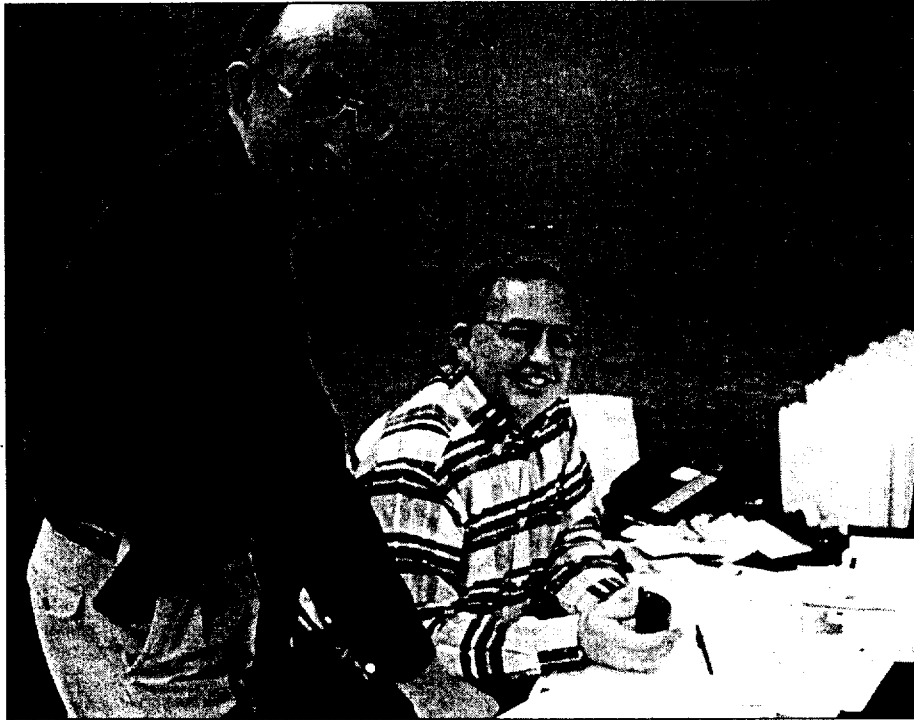
Not only did the calls go to the right public safety agency, the caller's location was accurately displayed on electronic maps in the emergency communications centers.

IDC was formed in 1997 by Jim Vroman and Dan Preston, longtime business associates in Vancouver, Wash. Preston is the technical expert and Vroman is the numbers man. Allen was brought on board in November to handle investment funding, and they moved the company into the former headquarters of Port Townsend Paper Co. last year.

Allen raised an additional \$3 million in financing in January.

Why Bainbridge Island?

Its proximity and ease of travel to downtown Seattle and the island's



Jim Vroman (left) and Dan Allen raised \$3 million in financing for their startup venture.

Jack Swanson/Staff Photo

excellent pool of potential future employees, Allen said. He and Vroman rave about the reception has received from islanders.

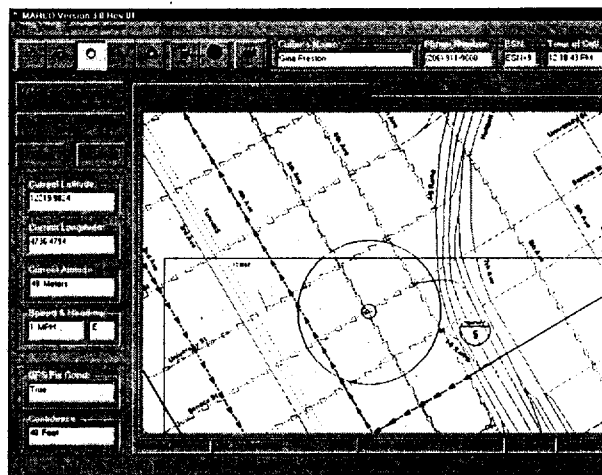
"This is a great place for a high-tech company," Allen said. "We love it here, and the community has embraced us."

"I also feel that when I walk down to the ferry dock I am among many very talented people. We also wanted to be out of the traffic, and we're only six miles west of the Space Needle."

Cell phone systems already have a rudimentary system for locating people. To equip each of the 80,000 cell sites with better equipment to do such searches would cost between \$20,000 and \$50,000 per site, according to IDC.

IDC's system is simpler. The key is a Global Positioning Satellite receiver the size of an aspirin tablet that can be implanted in the cell phone. The chip, made by another firm, transmits the phone's latitude, longitude, altitude, time, speed and direction of travel based on signals from the global satellite system operated by the U.S. Defense Department.

"We don't make the chip," Allen said. "We make a proprietary language that takes the information from the GPS chip, moves it through the cell phone and the wireless network to



Courtesy of IDC

A computer display shows the position of a cell-phone caller.

the call-taker station where the data is decoded."

Allen said he believes it will probably cost the average cell phone purchaser between \$8 and \$10 more per set for the chip.

Allen says he believes IDC's solution is still way ahead of others in the industry. The firm projects that loca-

tion-based technology will be an \$8 billion industry within four years, and it wants a big piece of the action.

But IDC's system isn't just about money, Vroman says.

"If we can find one lost child or someone in a car overturned in a ditch because of this technology, the effort will be worth it," he said.

## BUSINESS BRIEFING

### Cable modem service up

High-speed Internet access now available through cable television hookups, North Cable and SoftNet Systems announced this week.

"Northland is very excited to offer our subscribers an affordable option that lets them take full advantage of the ever-increasing number of media-rich services on the Internet," said Mark Saltrones, business manager.

### Broker holds free seminar

"Top Picks 1999" is the subject of a free seminar hosted by Salomon Smith Barney for investors at 6 p.m. today at Bistro Pleasant Beach, 241 Winslow Way. Patrick Nadeau, retail equity strategist, will speak. Reservations: 842-4

### Insurance firms merge

Tyszkowski/Hayward Insurance started on the island by Fred Tyszkowski in 1949, has merged with Soriano Insurance of Bremerton. The new company will be called Soriano Haywood Insurance Brokers of Tacoma.

Belfair resident Brian Hug will join the Bainbridge Island office as its manager and becomes vice president of Bratrud Middleton. The office is located at 283 Winslow Way.

### Brein named to OC board

Jeff Brein, president of Quinn Brein Public Relations and Partner in Entertainment Enterprises, has been elected to the Olympic College Foundation board of directors.

### Chamber sues the Web

Bob Malecki of Northwest Network Services will discuss Internet options for small, medium-sized businesses at the next meeting of the Chamber of Commerce, 11:30 a.m. March 18, at the MARC. Reservations: 842-3700.

# Wireless

WEEK

February 22, 1999

## Cellular/PCS

### IDC Trials Handset-based Phase II E911 Solution

By Sally Ruth Bourrie

**W**ith the FCC mandate for implementing phase II enhanced 911 compliance up in the air, there's still room for all kinds of approaches. Seattle-based Integrated Data Communications, Inc. just finished trials of a handset-based, global positioning system solution. The six-month trial took place on Interstate 5, covering urban canyons and suburban, rural and mountainous areas in the Seattle area.

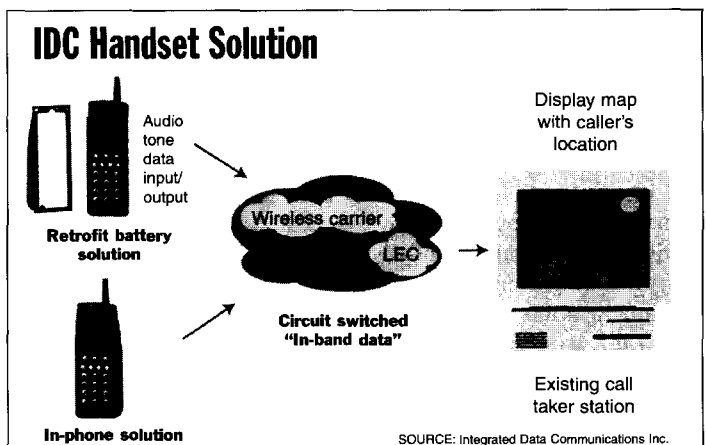
Of the 6,500 documented calls, IDC reported locating phones within 40 feet 90 percent of the time. "We can tell what direction you're going on the freeway; we can tell what lane you're in," said IDC President and CEO Dan Allen.

The IDC solution works with any standard GPS chip set and can be installed either by the manufacturer or in a retrofit kit, Allen said. IDC's proprietary language

calculates the longitude and latitude and time, direction and travel speed of the phone, then embeds it in the voice channel and sends the data simultaneously with the voice. At the public-safety answering point, the data is encoded and displayed on a map.

Using GPS can have drawbacks, said Mike Brower of Fall Creek Consultants in Felton, Calif., which focuses on wireless location markets and solutions. "Although [IDC's solution] is high-performance, it's still a line-of-sight system. It doesn't work indoors; it doesn't work in places where you'd need help like on the third deck of a car park."

To route the call, IDC uses a PSAP database provider, in this case SCC Communications Corp., whose system already was in place with local wireline carrier U S West. SCC has participated in four phase II trials, working with IDC's competitors TruePosition and SnapTrack Inc., whose ap-



**IDC's handset-based GPS solution provides information such as longitude and latitude and time, direction and travel speed of the phone.**

proaches are different. TruePosition uses a network-based system, while SnapTrack's solution is a hybrid of the two.

Network-based solutions are compatible with all existing handsets. But costs range from \$20,000-\$40,000 per cell site, though some experts think prices will decrease as competition increases.

IDC's GPS-based handset solution, which is the only purely handset-based approach so far, requires consumers to buy a new handset or use a retrofit kit. Allen

projects about a \$10 additional retail cost per handset and about \$30 for the retrofit kit.

"Ten dollars a handset is expensive," said International Data Corp. Research Analyst Callie Pottorf. "Carriers are going to have to subsidize the handset."

SnapTrack requires a server in the network along with GPS capability in the handset, inviting the pros and cons of both approaches. It's a more sensitive system than a purely handset-based system, Brower said, but it requires the network to operate. ■

# Business Journal

## Firm aims to develop pinpoint cellular technology

By M. Sharon Baker  
Staff Writer

Dan Allen, new chief executive of small Integrated Data Communications Inc., received a huge Christmas present last month.

On Dec. 24 the Federal Communications Commission ruled cellular carriers would be granted a waiver to meet requirements for pinpointing the origin of a cellular 911 call if they offered a solution inside a cellular phone.

The notice is a gold mine for Integrated Data, a company which just finished testing technology that puts a tiny Global Positioning Satellite receiver into cell phones. The tiny receivers and technology allow the Bainbridge Island company to pinpoint the location of a cellular caller within 40 feet.

Currently, wireless 911 calls are anonymous. Several companies, including Seattle-based Xypoint Corp., offer software that identifies a 911 caller's number and their approximate location as mandated in the FCC's first phase.

But in the second phase, carriers must adopt technology that's much more accurate.

That's where Integrated Data comes in. The firm's technology is significantly more accurate than technology being offered from many other wireless emergency 911 companies.

Integrated Data's technology also costs pennies compared to the multimillions cellular companies would have to pay for other solutions, such as installing technology at each of the 80,000-plus cell sites across the nation.

The company also seems to have the only stand-alone handset solution available.

"We're not aware of another pure handset solution," Allen said. "No one else is doing it."

" has the potential to play a pivotal role in a very significant industry," said Tom Huseby, general partner with SeaPoint Ventures in Bellevue. SeaPoint doesn't have a stake in Integrated Data, but Huseby has invested personally.

"Their technology allows a much more accurate and much less expensive approach."

The company's challenge, he said, is to get "a convergence of interest to happen in the marketplace. They've got to get the FCC to allow it, the carriers to want it and the equipment manufacturers to provide it. So far, they've accomplished the first one."

The FCC notice could make it easier for Allen, who joined the company in December, to complete the company's second round of financing, one that he hopes will bring in around \$3 million.

With that money, he plans to beef up the company's staff and land a major phone maker to incorporate the technology. If all goes according to plan, the technology could be in phones by late this year or early 2000.

That would be well before phase two of the FCC's public safety mandate date of October 2001. That's when all cellular companies must have technology in place to locate their customers within 400 feet, an area Allen says is roughly six blocks in downtown Seattle.

There are roughly two ways to pinpoint a caller's location, he said.

One way is a network solution, which means carriers triangulate the location using

the location of cell sites. This method typically comes within 400 feet of a caller, but isn't very accurate. For instance, one cell site could cover three different counties or cities.

"In the solution, we put a small GPS system, about the size of a pencil eraser, in handset," Allen said. "Using special coding, we can send latitude, altitude, time, speed and direction of travel to the E-911 call taker and we can do that within 40 feet. The other thing that we can do is actually route the call to the appropriate (emergency jurisdiction)."

That is, if an emergency call comes in from a person driving on Interstate 5 in King County, Integrated Data's technology can route the call to the Washington State Patrol, King County Police, Seattle City Police or other emergency agencies that depend on a very accurate location.

Integrated Data's technology works with every type of cellular and wireless technology on the market today, Allen said. The company recently completed a successful test of the technology with local wireless carriers, including AirTouch, GTE Wireless, Nextel and U S West, Allen said. Several King County police and emergency agencies participated as well.

"We had more than 6,500 documented calls to a 911-type number over five months and proved it works," Allen said.

In addition to selling its technology to phone makers and wireless companies, Integrated Data plans to offer a service for businesses that want to track vehicles or other goods moving around a large area.

That market could include tow trucks, courier services, package companies, and even railroad companies, Allen said.

Integrated Data's handset solution costs much less than the network solutions.

"There are some 80,000 cell sites across the nation, and it costs between \$20,000 to \$50,000 a site for a network solution," he said. "With a handset solution, there's no need to have to go back with improvements. You can change the technology every time a new phone comes out."

The cost of Integrated Data's technology hasn't been finalized, but Allen expects it will add less than \$10 to the cost of a wireless phone.

Integrated Data's technology differs from Xypoint's software offerings. Using various location technologies such as Integrated Data's, Xypoint makes network and applications that translate location information into something that cellular carriers and emergency dispatch centers can use.

For instance, the company provides the 10-digit call back number and the location of the cell site originating a 911 call.

Integrated Data was founded two years ago by Dan Preston and Jim Vroman. The two raised roughly \$850,000 in a first round of funding from a number of private investors, including several former high-level McCaw Cellular Communications executives.





**Integrated Data Communications, Inc.**  
**750 Ericksen Ave NE**  
**Bainbridge Island, WA 98110**  
**[www.idc-seattle.com](http://www.idc-seattle.com)**  
**phone: (206) 842-9262**  
**fax: (206) 842-9259**